

## AMENDMENT TO THE CLAIMS

1. (***Currently Amended***) A thermoplastic polyurethane composition, comprising:

the reaction product of

a polyester polyol having a number average of molecular weight of from about 500 to about 5,000 comprising polybutylene adipate;

from about 5 to about 20 parts by weight of a polyether co-polyol comprising poly(tetramethylene ether glycol) per 100 parts by weight of the combined total amount of said polyester polyol and said polyether co-polyol;

a diisocyanate having the formula  $R(NCO)_n$  where  $n$  is an integer of 2 and  $R$  is an aromatic, cycloaliphatic, aliphatic, or combinations thereof having from 2 to 20 carbon atoms;

a symmetrical chain extender selected from the group consisting of 1,6-hexanediol, 1,3-propanediol, 1,5-pentanediol, 1,4-butanediol, 1,4-cyclohexanedimethanol (CHDM), hydroquinone di( $\beta$ -hydroxyethyl)ether (HQEE), 1,4-benzenedimethylol, and combinations thereof;

from about 5 to about 10 moles of a co-chain extender selected from the group consisting of 1,3-butanediol, neopentylglycol, dipropylene glycol, diethylene glycol, di( $\beta$ -hydroxyethyl) resorcinol, 1,2-propylene glycol, and combinations thereof per 100 moles of said symmetrical chain extender;

the ratio of the molar percent of said co-chain extender to said symmetrical chain extender to weight percent of said polyether co-polyol to the combined total weight of said polyester polyol and said polyether co-polyol, being from about 0.2 to about 2,

wherein said reaction product has a reduced annealing value,  $V_t$ , of about 4.0 or less and a sensitivity of the complex viscosity to temperature  $V_{ft} ((T_m+15)/(T_m+35))$  of about 9 or less.

Claim 2 (***Cancelled***).

3. (***Previously Presented***) A thermoplastic polyurethane composition according to claim 1, wherein said reaction product has a sensitivity to shear  $V_f$  at  $T_m+15^\circ\text{C}$  of about 10 or less or a  $V_f$  at  $T_m+35^\circ\text{C}$  of about 5 or less.

4. (***Previously Presented***) A thermoplastic polyurethane composition according to claim 3, wherein the number average molecular weight of said polyester polyol is from about 600 to about 4,000; and

wherein the number average molecular weight of said polyether co-polyol is from about 500 to about 4,000, and

wherein said reaction product has a hydrolytic stability,  $TS_N$ , of about 0.3 or greater.

Claim 5 (***Cancelled***).

6. (***Previously Presented***) A thermoplastic polyurethane composition of claim 4 wherein said co-chain extender is neopentylglycol, dipropylene glycol, 1,3-butanediol, or mixtures thereof.

7. (***Previously Presented***) A thermoplastic polyurethane composition according to claim 6, wherein said reduced annealing value  $V_i$  is about 3.5 or less, wherein said  $V_f$  at  $T_m+15^\circ\text{C}$  is about 6 or less, and said  $V_f$  at  $T_m+35^\circ\text{C}$  is about 4 or less, wherein said polyether co-polyol is poly(tetramethylene ether glycol), wherein said diisocyanate is MDI or  $H_{12}$ MDI, or combinations thereof, wherein said symmetrical chain extender is 1,4-butanediol; and

wherein said co-chain extender is 1,3-butanediol, neopentylglycol, or dipropylene glycol.

Claim 8-9 (***Cancelled***).

10. (***Currently Amended***) A thermoplastic polyurethane composition according to claim 7, wherein said polyester polyol further comprises one or more additional polyols [[is]] derived from adipic acid, suberic acid, sebacic acid, or azelaic acid, or combinations thereof with 1,4-butanediol, 1,6-hexanediol, neopentyl glycol, diethylene glycol, or combinations thereof.

Claims 11-12 (*Cancelled*).

13. (*Currently Amended*) A thermoplastic polyurethane composition of claim 1 wherein at least four of the following six (A through E [[F]]) criteria are met:

- A. a reduced ~~crystallinity~~ crystallinity expressed as  $T_{CN}$  is 0.95 or less,
- B. an improved hydrolytic stability expressed as  $TS_N$  is 0.3 or greater,
- C. a reduced sensitivity to shear expressed as  $V_f(T_m + 15)$  is 10 or less,
- D. a reduced sensitivity to shear expressed as  $V_f(T_m + 35)$  is 5 or less, and
- E. a sensitivity of the complex viscosity to temperature expressed as  $V_{ft}$  is 10 or less, ~~and~~
- ~~F. a reduced annealing expressed as  $V_t$  is 4 or less.~~

Claims 14-18 (*Cancelled*).

19. (*Original*) A coated fabric wherein said coating comprises the thermoplastic polyurethane composition of claim 1.

20. (*Original*) A coated fabric wherein said coating comprises the thermoplastic polyurethane composition of claim 13.

Claims 21-22 (*Cancelled*).

23. (*Original*) A sheet or a film comprising the thermoplastic polyurethane composition of claim 1.

24. (*Original*) A sheet or a film comprising the thermoplastic polyurethane composition of claim 13.

Claims 25-26 (*Cancelled*).

27. (*Original*) A conveyor belt comprising the thermoplastic polyurethane composition of claim 1.

28. (**Original**) A conveyer belt comprising the thermoplastic polyurethane composition of claim 13.

Claims 29-30 (**Cancelled**).

31. (**Original**) An inflatable article, an apparel, or a storage bag comprising the thermoplastic polyurethane composition of claim 1.

32. (**Original**) An inflatable article, an apparel, or a storage bag comprising the thermoplastic polyurethane composition of claim 13.

Claims 33-34 (**Cancelled**).

35. (**Currently Amended**) A process for producing a thermoplastic polyurethane polymer comprising reacting:

A. a polyester polyol having a number average molecular weight of from about 500 to about 5,000 comprising polybutylene adipate;

B. from about 5 to about 20 parts by weight of a polyether co-polyol comprising poly(tetramethylene ether glycol) per 100 parts by weight of the combined total amount of said polyester polyol and said polyether co-polyol;

C. a diisocyanate;

D. a symmetrical chain extender selected from the group consisting of 1,6-hexanediol, 1,3-propanediol, 1,5-pentanediol, 1,4-butanediol, 1,4-cyclohexanedimethanol (CHDM), hydroquinone di( $\beta$ -hydroxyethyl)ether (HQEE), 1,4-benzenedimethylol, and combinations thereof;

E. from about 5 to about 10 moles of a co-chain extender selected from the group consisting of 1,3-butanediol, neopentyl glycol, dipropylene glycol, diethylene glycol, di( $\beta$ -hydroxyethyl) resorcinol, 1,2-propylene glycol, and combinations thereof per 100 moles of said symmetrical chain extender; and

wherein the ratio of the molar percent of said co-chain extender to said symmetrical chain extender to weight percent of said polyether co-polyol to the combined total

weight of said polyester polyol and said polyether co-polyol, is from about 0.2 to about 2.

36. (*Previously Presented*) The process of claim 35 further comprising a thermoplastic polyurethane catalyst in an amount less than about 1000 parts by weight per million parts by weight of the combined weight of said polyester polyol, polyether co-polyol, diisocyanate, symmetrical chain extender and said co-chain extender.

37. (*Previously Presented*) The process of claim 36 wherein said process is conducted in a twin screw extruder where the reactants are brought together and reacted.

38. (*Original*) The process of claim 37 wherein said process is conducted at from about 110°C to about 200°C.

39. (*Original*) The process of claim 38 wherein the reaction time is from about 2 to about 3 minutes.

Claims 40-41 (*Cancelled*).

42. (*Currently Amended*) The process of claim 35 wherein said polyester polyol further comprises one or more additional polyols [[is]] derived from an acid selected from the group consisting of adipic acid, suberic acid, sebacic acid, azelaic acid, and combinations thereof reacted with a glycol selected from the group consisting of 1,4-butanediol, diethylene glycol, 1,6-hexanediol, neopentyl glycol and combinations thereof.

43. (*New*) The thermoplastic polyurethane composition of claim 1 wherein the diisocyanate comprises diphenylmethane-4,4'-diisocyanate, the symmetrical chain extender includes 1,4-butanediol, the co-chain includes 1,3-butanediol, dipropylene glycol and combinations thereof.

44. (*New*) The thermoplastic polyurethane composition of claim 43 wherein the mole ratio of the diisocyanate to the combination of the polyester polyols, the polyether

copolyols, the symmetrical chain extender, and the co-chain extender is from 0.98 to 1.03; the mole ratio of the combination of the symmetrical chain extender and the co-chain extender, to the combination of the polyester polyol and the polyether polyol, is from 0.7 to 3.

45. (*New*) The process of claim 35 wherein the diisocyanate comprises diphenylmethane-4,4'-diisocyanate, the symmetrical chain extender includes 1,4-butanediol, the co-chain includes 1,3-butanediol, dipropylene glycol and combinations thereof.

46. (*New*) The process of claim 45 wherein the mole ratio of the diisocyanate to the combination of the polyester polyols, the polyether copolyols, the symmetrical chain extender, and the co-chain extender is from 0.98 to 1.03; the mole ratio of the combination of the symmetrical chain extender and the co-chain extender, to the combination of the polyester polyol and the polyether polyol, is from 0.7 to 3.